APPLICATION FOR
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IN THE NAME OF

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Assigned to

INTEL CORPORATION

for

METHOD AND APPARATUS FOR
FORWARDING ELECTRONIC MAIL
FOR DISABLED ACCOUNTS

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METHOD AND APPARATUS FOR
FORWARDING ELECTRONIC MAIL
FOR DISABLED ACCOUNTS

5 ## BACKGROUND

1. Field of the Invention

Embodiments described herein are directed to a system for forwarding electronic mail for disabled accounts. Specifically, users who want their electronic mail forwarded from one account to another register themselves on the system. Users who want to send electronic mail to

10 individuals in need of forwarding send the electronic mail to the system using the former addresses of the recipients. The system then forwards the electronic mail if a new forwarding address is found or simply forwards to the former electronic mail address if a new address is not found. In addition, a user who sends an undeliverable electronic mail to a recipient may then resend it to the system for forwarding.

15 ### 2. Related Art

Most current systems allow forwarding options for active accounts. Some organizations, such as acm.org, for example, provide electronic mail forwarding as long as an individual remains a member of the organization. Yet, no systems are employed for forwarding electronic mail for a disabled account when the individual does not remain as a member of a specific

20 company or organization. For instance, to encourage users not to change providers, Internet Service Providers ("ISP") do not forward electronic mail for a user once that user switches providers. As such, many users who are dissatisfied with an ISP continue to use the provider so as not to worry about losing valuable electronic mail messages.

Anonymous re-mailers rely on a third server to forward electronic mail. With

25 anonymous re-mailers, the sender's identity is hidden while the recipient's identity is known.

There exists, however, a legitimate business need for a different approach in which the sender's identity is known while the electronic mail address of the recipient is unknown. In this way, the probability of misuse of the system is reduced, and privacy of the recipient is maintained.

There is, therefore, a need for an inexpensive and universal solution to enable a user to

5   change service providers or to continue to receive electronic mail after leaving a company.

BRIEF DESCRIPTION OF THE DRAWINGS

A detailed description of embodiments of the invention will be made with reference to the accompanying drawings, wherein like numerals designate corresponding parts in the several figures.

10   FIG. 1 is an illustration of the components of an apparatus for forwarding electronic mail for disabled accounts, according to an embodiment of the present invention.

FIG. 2 is a flowchart showing the steps involved in forwarding electronic mail for disabled accounts, according to an embodiment of the present invention.

DETAILED DESCRIPTION

15   The following paragraphs describe a method and apparatus for forwarding electronic mail for disabled accounts. Oftentimes, electronic mail sent to a former electronic mail address cannot be forwarded to a new electronic mail address for a variety of reasons. For example, an AOL customer may wish to subscribe to another service provider such as NetZero or Earthlink. AOL does not provide electronic mail forwarding services, however, so as to discourage

20   subscribers from leaving its service. As another example, an individual working for a company may change jobs. The company, for security reasons, does not forward electronic mail. In both cases, there is a need for the individual who migrates to a new electronic mail address to notify others of the change. Of course, not all interested parties may be notified because of careless

omissions. In addition, not all interested parties may update their address books promptly to reflect the change in the electronic mail address.

According to one embodiment of the present invention, as illustrated in Figure 1, an electronic mail forwarding system for disabled accounts **100** is comprised of a server **150** that

5 performs forwarding searches and forwarding actions. A database **160** is included for entering, updating, and maintaining both source and destination electronic mail addresses for forwarding.

User-computers **110** who want their electronic mail forwarded from one account to another account register themselves on the electronic mail forwarding system for disabled accounts **100**. That is, the user-computers **110** send a message to the forwarding system's

10 account **140**, e.g. portal@mf.com, where mf.com is the company that provides the forwarding service, over a data communication network **130**. The data communication network **130** may be the Internet, an intranet, or any other kind of public, private, or other data communication network. The forwarding system's account **140** may be located on the server **150** or may be a separate, intermediary computer.

15 Sender-computers **120**, who wish to send electronic mail to user-computers **110** in need of forwarding or who have unsuccessfully attempted delivery to a user-computer's **110** electronic mail address which is no longer reachable, send electronic mail to the forwarding system's account **140** over the data communication network **130** using the last known electronic mail addresses of the user-computers **110**. The sender-computers **120** do not need to know which

20 electronic mail addresses need forwarding. Instead, the sender-computers **120** simply address the electronic mail as usual.

The server **150** of the electronic mail forwarding system for disabled accounts **100** then forwards the electronic mail provided that a new forwarding address is found. If a new address

is not located, then the server **150** simply forwards the electronic mail to the last known

electronic mail address. For a resolved electronic mail that is forwarded successfully by the

forwarding system **100**, the sender-computer's **120** electronic mail address is transferred to the

user-computer **110**. User-computer **110** then has the option of either responding to the sender-

5   computer **120** directly or responding through the forwarding system's account **140**. In the latter

case, the user-computer's **110** most current electronic mail address may be made unavailable to

the sender-computer **120**, for privacy concerns. In another embodiment of the present invention,

the sender-computer **120** may receive a message from the forwarding system's account **140**

stating that the sender-computer's **120** electronic mail was forwarded successfully to user-

10   computer **110** and that user-computer **110** will respond at his convenience. In another variation

of this scenario, the user-computer **110** may compose a message indicating that user-computer

110 has received a forwarded message. User-computer **110** may choose to provide sender-

computer **120** with user-computer's **110** new electronic mail address.

For unresolved electronic mail addresses, the sender-computer **120** will receive the

15   typical messages that describe undeliverable mails, if indeed the electronic mail account is not

reachable for some reason. The message will further indicate that no forwarding account

information is available.

Data clean-up for the database **160** is performed by a suitable software program that is

equipped to detect forwarding cycles such as A to B and B to A and remove them as well as to

20   detect chaining and simplify them. For instance, an electronic mail from A to B that is then

forwarded from B to C may be simplified as transmitted from A to C. Another software program

is implemented to add fields to the forwarded electronic mail, including a sender-computer's **120**

electronic mail address as well as the address to which the electronic mail was initially targeted.

An address bank for each user-computer **110** is also included which includes the user-computer's **110** disabled and new electronic mail address. A software program that can delay the forwarding of electronic mail, if necessary or at a specified time may further be used.

Plugins for sender-computers **120** who use the electronic mail forwarding system for
5 disabled accounts **100** are also included. The sender-computers **120** may optionally use these plugins for convenience. The plugins transform user-computers' **110** electronic mail addresses and adds them as part of the electronic mail body. The plugins further inform sender-computers **120** that the electronic mail has been transformed and not directed to the user-computers' **110** electronic mail address directly.

10 For instance, the following provides an example of an electronic mail that may be composed by sender-computer **120** using Simple Mail Transfer Protocol ("SMTP"), RFC821, published August 1982, authored by Jonathan B. Postel, syntax ("S" is the sender-computer and "U" is the user-computer):

```
S: MAIL FROM: sender@hightech.com
15  U: 250 OK
S: RCPT TO: user@expensiveISP.com
U: 250 OK
S: DATA
U: 354 Start mail input; end with <CRLF>. <CRLF>
20  S: Hello, how are you? . . .
U: 250 OK
S: QUIT
```

The following is an example of how the original electronic mail message composed by
25 sender-computer **120** may be modified manually or transformed automatically by a mail plugin program. This is the electronic mail that is sent to the forwarding system's account **140**.

```
S: MAIL FROM: sender@hightech.com
U: 250 OK
S: RCPT TO: portal@mf.com
30  U: 250 OK
```

S: MFWD: user@expensiveISP.com
U: 354 Start mail input, end with <CRLF>. <CRLF>.
S: Hello, how are you? . . .
U: 250 OK
5   S: QUIT

The following example now shows the electronic mail message as forwarded to user-computer **110** after the server **150** determined to which address to forward. The user-computer **110** is provided with the identity of the sender-computer **120** and from which electronic mail

10   account the message is being forwarded.

S: MAIL FROM: sender@hightech.com
U: 250 OK
S: RCPT TO: user@cheapISP.com
U: 250 OK
15   S: DATA
S: MFTO: user@expensiveISP.com
U: 354 Start mail input; end with <CRLF>. <CRLF>
S: Hello, how are you? . . .
U: 250 OK
20   S: QUIT

The examples above illustrate how software programs may be constructed to implement the method. Although only simple examples of forwarding to one electronic mail address are provided, the server **150** of the electronic mail forwarding system for disabled accounts **100** can perform multiple forwarding operations by using repeated mail forward "MFWD" strings, for

25   example.

According to an embodiment of the present invention, Figure 2 illustrates how the system operates. A user-computer **110** wishes to leave her existing Internet Service Provider "expensiveISP.com" to another provider "cheapISP.com." The user-computer's **110** old and new electronic mail accounts are user@expensiveISP.com and user@cheapISP.com,

30   respectively. As shown in step **210**, before user-computer **110** leaves expensiveISP.com entirely, user-computer **110** registers on the electronic mail forwarding system for disabled accounts **100**,

e.g., mf.com to have electronic mails forwarded from user@expensiveISP.com to user@cheapISP.com. The old account is then disabled after registration. As depicted in step 220, mf.com verifies with the user-computer 110 that the user-computer 110 is legitimate by sending an electronic mail with a required password to user@expensiveISP.com.

5   A sender-computer 120, e.g. sender@hightech.com, wishes to send electronic mail to user-computer 110. Sender-computer 120 vaguely remembers that user-computer 110 planned on changing electronic mail accounts. Yet, sender-computer 120 does not have the updated information. As described by step 230, sender-computer 120 uses the electronic mail forwarding system for disabled accounts 100 by sending an electronic mail to the forwarding system's

10   account 140, e.g. portal@mf.com. Sender-computer 120 specifies user@expensiveISP.com as the intended recipient. The electronic mail forwarding system for disabled accounts 100 then searches its database 160 for a forwarding electronic mail address. This action is shown in step 240. As described in step 250, if the database 160 locates a match, the server 150 then forwards the electronic mail to user@cheapISP.com along with information about the original sender-

15   computer 120. As such, the user-computer 110 may then respond directly to the sender-computer 120 or may respond to the sender-computer 120 indirectly through the electronic mail forwarding system 100, as illustrated in step 260. Moreover, the sender-computer 120 may receive a message, composed by either the system or the user-computer 110, stating that the electronic mail has been forwarded. The user-computer 110 may wish to provide the new

20   electronic mail address to sender-computer 120.

        When the database 160 does not find a new destination electronic mail address, the server 150 simply forwards the electronic mail to the user-computer's 110 former electronic mail address. This action is described in step 270. As depicted in step 280, the sender-computer 120

then receives a message from the electronic mail forwarding system for disabled accounts **100** indicating that the electronic mail was undeliverable as the user-computer's **110** old account is no longer reachable and that no forwarding account information is available.

While the above description refers to particular embodiments of the present invention, it will be understood to those of ordinary skill in the art that modifications may be made without departing from the spirit thereof. The accompanying claims are intended to cover any such modifications as would fall within the true scope and spirit of the present invention.

The presently disclosed embodiments are therefore to be considered in all respects as illustrative and not restrictive; the scope of the invention being indicated by the appended claims, rather than the foregoing description. All changes that come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.